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Chair: Hon. Ron Wyden, US Senate

Topic: The 21st Century Nanotechnology Research and Development Act

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Introduction:

Mr. Chairman, Senator Allen, members of the subcommittee, I thank you for allowing me –- --on behalf of the NanoBusiness Alliance and our member organizations -- the opportunity to testify before you on the topic on nanotechnology, and its transition from a science into a business.

Today, nanotechnology is rapidly becoming the Industrial Revolution of 21st century. The importance of nanotechnology cannot be overstated. It will affect almost every aspect of our lives- our food, clothing, medicines, computing and energy needs. More importantly, for every area where we can fathom an impact from nanotechnology, there will be others no one has thought of -- new capabilities, new products, and new markets.

Today's nanotech industry might be compared to the computer industry of the 1960s, before the integrated circuit, or the biotech industry of the 1970s. But while many nanotechnology sectors are in their nascent stages, others are already delivering products to the market. A variety of nanomaterials, for instance, including enhanced polymers, coatings, and fillers, are already available, producing revenues, and profits. And advanced nanotech medical and electronics applications will be imminently impacting lives.

As production of nano-products becomes easier, faster and cheaper, every market sector will begin to feel their impact. We at the NanoBusiness Alliance estimate that the global market for nanotechnology-related products and services could reach more than $225 billion in 2005. The NSF conservatively predicts a $1 trillion global market for nanotechnology in little over a decade.

The National Nanotechnology Initiative:

Since its inception the National Nanotechnology Initiative (NNI) has proven to be an incredible instance of government outpacing the imagination of the private sector. Mike Roco, Jim Murday and the other individuals who created and continue to advance the NNI should be commended.

That is why the NanoBusiness Alliance and its members would like to enthusiastically endorse the 21st Century Nanotechnology Research and Development Act that is being introduced by this Senator Wyden. By all accounts it will be a vital and timely bill that builds on the fine work of the NNI and will assist America's long term scientific and economic competitiveness in this field.

State of NanoBusiness

Nanotechnology is becoming nanobusiness faster than anyone imagined.

Corporations

Just five years ago only a few corporate visionaries – IBM, HP, TI among them – were undertaking any research and development in the nanosciences. Today you'd be hard pressed to find a member of the Fortune 500 that does manufacturing without some nanotechnology effort –GM, GE, Siemens, Intel, Hitachi, Dow, etc have launched significant nanotech initiatives.

Start-Ups

Unlike the Dot-com era, nanotech start ups are built on science. They have real technology. Real assets. And more often than not, they are founded by researchers from universities, government and corporate laboratories.

More than half the world nanotech start ups are in the US. And while it is difficult to pin an exact number on how many there are, it is safe to say that at least a 1,000 are currently in operation up from approximately 100 three years ago.

Funding:

Venture capitalists, institutional investors and wealthy angels have also begun to see the potential in nanotech, and, though chastened by the lessons of the "dot-com disaster," are nevertheless aggressively seeking investment opportunities. Over 60 US venture capital firms, in addition to numerous corporate venturing operations, have invested in nanotech-related companies.

Investment in nanotechnology start-ups will rise from $100 million in 1999 to a projected $1 billion by 2003.

Regional Development:

Ultimately, regional development efforts --the creation of technology clusters (Nanotech Valleys if you will) -- will fuel the explosive growth of the nanotechnology industry

Localized development efforts are already underway from Virginia to Texas to California. The Alliance launched a "Nanotech Hubs Initiative" a few months to jump start regional technology cluster development. We have been overwhelmed. Though we have launched efforts in six regions--as well as affiliates in the EU and Canada – we have been inundated with calls from 35 states and 11 countries to help develop this capacity. These states and regions are already looking to nanotechnology to ignite economic development.

Foreign Competition

Nanotechnology is emerging as a truly global technology. Unlike the many waves of technological development, nanotechnology is not dominated by the United States. In several areas of nanotechnology the US is being outpaced by foreign competition. The Japan, EU, Russia, Korea, and China are all significant players in the field of nanotechnology

A recent report from the Journal of Japanese Trade & Industry notes that the Japanese government views the successful development of nanotechnology as the key to "restoration of the Japanese economy." They are not alone. Funding has grown at unprecedented rates across the globe over the last three years.

Problems in the NanoBusiness World

Not everything is rosy for the future of nanobusiness. While the NNI and overall government nanotech efforts have been a great source of coordination and basic research funding for many, these nanotech grants remain among the most competitive in the government.

In addition, many nanotech companies have emerged from the basic research cycle and are addressing issues such as scaling and integration. Few government programs address this timeframe. Add to that a venture capital sector that is unwilling to and you have companies falling into what investors term "Death Valley."

Another area of concern for nanotech start ups is the current state of US intellectual property. The Patent Office is in desperate need of training programs to ensure its examiners understand nanotechnology and its multi-disciplinary nature.

Another grave fear is the uneasiness over the lack of research on nanotech health and safety issues. More than one CEO has asked "are we sitting on the next asbestos working with all these tiny things."

In addition, the current state of technology transfer is lacking by any measure. The technology transfer process from government and academic labs to the marketplace is impossible at worst – arduous at best.

And lastly, education, as well workforce training and development are beginning to become issues among the nanotech community.

Close

In closing, nanotechnology the science is indeed now rapidly becoming nanotechnology the business. As a nation we have been very fortunate to have the visionary support --from both sides of the aisle -- in developing and maintaining the NNI. However, we are now at a cross roads where we must expand its reach from the laboratory to the board room. While maintaining the development of basic research as a priority, we must expand our sights to cultivate the nanotechnology industry and usher in a new Industrial Revolution. Again, that is why the 21st Century Nanotechnology Research and Development Act is so important.

1. We see the Act's ability to strengthen the structure of the NNI as being of vital importance -- increasing the long term stability and growth of our Nation's nanotechnology efforts.
2. The Act makes the development of the nanotechnology sector a major government focus. We especially support Act's call for the development of a government advisory board.
3. To ensure America's long term leadership in nanoscience and nanobusiness, we also strongly support the Act's call for further examination and tracking of international funding, development and competition.
4. And, we back the Act's efforts to encourage nanoscience through additional grants, and the establishment of interdisciplinary nanotechnology research centers, as this will lead to more innovation and further development of the nanotech economy.

Long term, the Alliance would like to see Congress continue its focus on nanotechnology developing programs - and expanding existing programs - for commercializing nanotechnology development.

- Create programs that offer opportunities to entrepreneurial start-ups and innovative corporations alike. Programs that offer contract opportunities, incentives, loans, and funding to take nanotechnology innovations into the marketplace.

- Ensure that the USPTO is properly educated and equipped to evaluate and approve nanotechnology patents

- Organize an extensive global effort with industry, academia and government to study the health and environmental effects

- Develop programs that promote and nurture regional nanotechnology cluster development.

- Develop programs to improve the state of tech transfer at government labs and academic institutions which will improve the commoditization of emerging technologies

Again, I would like to thank the Chairman, Senator Allen and the Committee for this opportunity to address them.